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UNIVERSAL CEMENT DEVELOPED IN USSR

/The following article was signed by B. R./

All adhesives, natural and synthetic, cement various similar materials well: fibers with fibers, glass with glass, and rubber with rubber. But none of these adhesives is suitable for cementing wood with metal or leather with glass.

The problem of cementing different materials has interested engineers and scientists for a long time. The development of an adhesive that would enable one to cement metal with leather, glass with wood, metal with glass, etc. is especially appealing.

Scientists of various countries have attempted to solve this important technical problem, but none of them has completely succeeded. The problem was finally solved by I. N. Nazarov, the Soviet scientist. He obtained a substance called vinyl ethyl carbinol, otherwise known as carbinol cement.

Vinyl ethyl carbinol and its homologs are obtained by the reaction of vinyl acetylene with ketones according to the following formula:

$$CH_2 = CH - C \equiv CH + \underset{\displaystyle R}{\overset{\displaystyle R}{\underset{|}{\overset{|}{C}}}} = O \longrightarrow CH_2 = CH - C \equiv C - \underset{\displaystyle R}{\overset{\displaystyle R}{\underset{|}{\overset{|}{C}}}} - OH$$

The reaction is carried out in the presence of potassium hydroxide. Both aliphatic and alicyclic ketones may be used.

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Carbinol cement is a colorless liquid with a bp of 51-52°C. On standing, it becomes sirupy, and then it is transformed into a heavy, transparent, yellow mass. At an ordinary temperature this process /of polymerization/ continues for about 2 months. However, when a sufficient amount of 1-2 percent nitric acid is added, the liquid is transformed into a solid mass in the course of 3 hrs. Some other catalysts, for instance benzoyl peroxide, function in exactly the same manner.

Carbinol sirup adheres well to glass, metal, china, marble, leatheroid, wood, and leather. It cements everything: wood with glass, glass with leather, leather with marble, and, what is most important, metal with metal and even aluminum with aluminum.

Tests were made at one of the factories. Several sheets of finished aluminum were cemented together. From the resulting sheet a plate was stamped out in the usual manner. In the process of stamping, the sheet was stretched out to some extent, but the cemented joints still did not break at any point.

Carbinol cement hold equally firm at minus 60 degrees and plus 60 degrees. It does not dissolve in oil, in benzene, or in acetone. Water, acid, and alkali have no effect on it.

Carbinol cement joins together ferrous metals especially well. Because cast iron lends itself with difficulty to autogenous welding, it had to be joined by bolts. This process, which requires a great deal of labor and expense, is now replaced by the simple and cheap process of cementing.

Formerly, machines were fastened to the floor by means of bolts; but now in several shops they are cemented in place with carbinol cement.

The invention of Prof Nazarov permitted the replacement of Canada balsam, which was used to cement lenses in the complicated objectives of optical instruments.

Carbinol cement is used for the marble slabs which line the corridors and rooms in the new stations of the Moscow subway.

Nazarov's cement is also useful to the tailor. Formerly, only a highly skilled tailor experienced in patching could repair torn clothing. Now a torn fabric can be cemented. Carbinol glue is spread on a small piece of cloth which is then placed on the reverse side of the torn section. On the outer side of the material the threads are smoothed out. After this, when the cement dries, traces of the repairs can be discovered only by an experienced eye.

Prof Nazarov received a Stalin Prize for his remarkable invention.

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